next to those put forward by THIESSEN in connection with the microscopic study of coal, are those of WHITE in regard to the formation of anthracites as the result rather of thrust action than of heat devolatilization, and of DAVIS as to the origin of vegetable accumulations in the United States, which he considers to have been formed mainly under open water. DAVIS' conclusions in regard to the origin of our peat accumulations are all the more interesting as he accepts the orthodox geological view of German origin in regard to the formation of coals from humic matter or peat. It is apparently not without significance that in a country of the extent of the United States, which today is neither extremely cold toward the north nor extends into the tropical regions in the south, the most important accumulations of vegetable matter in nature are not in peat bogs, but in the depths of open waters. A stronger argument derived from the conditions of the present for the aquatic origin of combustible minerals could scarcely be advanced.

It seems clear that improvements in botanical technique have brought within sight the settlement of the long dispute in regard to the mode of origin of what must be regarded both as the most valuable and the most abundant of all minerals. Coal is the universal industrial energy-producing and deoxidizing agent, since it is the only considerable mineral substance of natural occurrence which is not combined with large quantities of oxygen. It will be of interest to follow the investigations, now rendered possible, which will tend to establish a relation between the organization of coal and its industrial utilization in connection with the development of power, the manufacture of oil, gas, coke, dyes, antiseptics, high explosives, lampblack, electric carbons, etc.—E. C. JEFFREY.

NOTES FOR STUDENTS

Current taxonomic literature.—J. A. NIEUWLAND (Am. Mid. Nat. **3**:265–270. 1914) has described 4 new species of *Lythrum* from the Central and Southern states.—V. NORLIND (Rep. Sp. Nov. **13**:401–403. 1914) has published two new species of *Polygala* from Brazil.—F. OSTERMEYER (*ibid.* 395) records a new *Cochlospermum* (*C. Zahlbruckneri*) from Argentina.—N. PATOUILLARD (Bull. Soc. Mycol. France **30**:345–354. 1914) under the title "Contribution à la Flore Mycologique hypogée du Jura" proposes a new genus (*Stephanospora*) based on *Hydnangium carotaecolor* Berk. & Br.—J. PERKINS (Eng. & Prantl. Nat. Pflanzenf. Ergänzungsheft III, zu II–IV für die Jahre 1905–1912, p. 94. 1914) has proposed the name *Carnegieodoxa* for *Carnegia* Perk., not Britt. & Rose.—F. PETRAK (Ann. Mycologici **12**:471–479. 1914) under the title "Beiträge zur Pilzflora von Mähren und Österr.-Schlesien" includes the description of two new genera, namely *Herpotrichiella* and *Leptomassaria*.—R. PILGER (Notizblatt Königl. Bot. Gart. u. Mus. Berlin **6**:109–212. 1914) in cooperation with several specialists under the title "Plantae Uleanae novae vel minus cognitae" has published about 130 new species of Pteridophyta and Spermatophyta from South America based primarily on the collections of

E. ULE from the region of the Amazon. The following new genera are proposed: *Sohnreyia* Krause of the Rutaceae, *Spirotheca* Ulbrich of the Bombaceae, and *Lychniothyrsus* Lindau of the Acanthaceae.—H. PITTIER (Rep. Sp. Nov. **13**:312–320. 1914) has published 12 new species of Malvales from Central America. Two new genera are included, namely *Goethalsia* of the Tiliaceae and *Gyranthera* of the Bombacaceae.—J. A. PURPUS (Monats. für Kakteenkunde **24**:65, 66. 1914) describes and illustrates a new species of *Echeveria* (*E. leucotricha*) from Mexico.—L. QUEHL (*ibid.* 114–118, 158) describes and illustrates two new species of *Mamillaria* from Mexico.—L. RADLKOFFER and J. F. ROCK (Terr. Hawaii, Board of Agr. and Forestry, Div. Forest. Bot. Bull. no. 1, pp. 1–14. 1911) under the title "New and noteworthy Hawaiian Plants" have published several new species of orchids and include a new genus (*Hibiscadelphus*) of the Malvaceae.—R. A. ROLFE (Kew Bull. 1914. p. 210) has published 3 new species of flowering plants from Costa Rica and Peru. The same author (Curtis' Bot. Mag. *pl. 8551*. 1914) describes and illustrates a new orchid (*Epidendrum profusum*) from Mexico.—C. O. ROSENDAHL (Bot. Jahrb. **50**:375–397. 1914. Supplement-Band) presents a revision of the genus *Mitella*, recognizing 12 species, one of which is new to science.—W. E. SAFFORD (Jour. Wash. Acad. Sci. **4**:356–368. 1914) presents a paper on "*Acacia cornigera* and its allies" and describes 10 new species.—J. H. SCHAFFNER (Ohio State Univ. Bull. **18**:127–247. 1914) has issued a "Catalog of Ohio vascular plants" in which he lists 2065 species for the state of Ohio.—J. SCHILLER (Sitzungsber. K. Akad. Wiss. **122**:621–630. 1913) under the title "Vorläufige Ergebnisse der Phytoplankton Untersuchungen auf den Fahrten S.M.S. Najade in der Adria" describes several species new to science and proposes a new genus (*Cymbomonas*) of the Chlorophyceae.—R. SCHLECHTER (Rep. Sp. Nov. **13**:279–287. 1914) gives a discussion of *Philibertia* and *Funastrum* and makes several new combinations in these genera pertaining mostly to Mexican and South American species. The same author (*ibid.* 438–443) has published 11 new species of Asclepiadaceae from Bolivia, based on collections of TH. HERZOG, and (Orchis **8**:18–19, 131–137. *pls. 3, 4.* 1914) describes and illustrates new species of orchids of which 4 are from America.—B. SCHRÖDER (Hedwigia **55**:183–223. 1914) in a concluding article on the "Zellpflanzen Ostafrikas" proposes the following new genera of the Scenedesmaceae: *Schmidleia*, *Schroederiella*, and *Victoriella*.—O. E. SCHULZ (Bot. Jahrb. **50**:176–187. 1914. Supplement-Band) under the title "*Bidens chinensis* (L.) Willd. und verwandte Arten" includes a new species of *Bidens* from Costa Rica.—W. A. SETCHELL (Univ. Calif. Publ. Bot. **6**:79–152. *pls. 10–16.* 1914) under the title "The *Scinaia* assemblage" presents a synoptical revision of this group. The author recognizes 11 species of *Scinaia* of which 5 are new and 7 species of *Gloiophloea* of which 4 are new to science. One new genus is proposed, namely *Pseudoscinaia*, to which two species are referred, one from California, the other from New Holland.—M. SLOSSON (Bull. Torr. Bot. Club **41**:307–309. *pl. 7.* 1914) records a new fern (*Adiantum*

rimicola) from Utah.—J. J. SMITH (Bull. Jard. Bot. Buit. II. no. 14, pp. 1–56. 1914) under the heading "Die Orchideen von Java" describes several new species and characterizes a new genus (*Abdominea*).—O. STAPF (Bull. Kew 1914, p. 326) records a new species of *Crataegus* (*C. Lindenii*) from Chiapas, Mexico.—T. STUCKERT (Ann. Conserv. et Jard. Bot. Genève **17**:278–309. 1914) under the general heading of "Beiträge zur Kenntnis der Flora Argentiniens" in cooperation with the eminent agrostologist Prof. E. HACKEL has published a fourth article on the grasses of Argentina in which several species new to science are recorded.—H. and P. SYDOW (Philipp. Jour. Sci. Bot. **8**:265–285. 1913) under "Enumeration of Philippine Fungi" describe 37 new species and raise *Tephrosticta*, hitherto regarded as a subgenus of *Teichosporella*, to generic rank. The same authors (Ann. Mycologici **12**:158–165, 195–204, 545–576. 1914) have published a number of new species of fungi and characterize the following new genera: *Nematostoma* of the Sphaeriaceae found on leaves of *Artemisia vulgaris* L. in northern Japan, and *Theissenula*, *Rizalia*, *Meliolina*, *Pycnoderma*, *Angatia*, *Odontoschizon*, *Manilaea*, *Exotrichum*, and *Psalidosperma* from the Philippine Islands.—F. THEISSEN (Ann. Mycologici **12**:63–75. *pls. 6, 7.* 1914) in an article entitled "Über *Polystomella*, *Microcyclus*, u. a." characterizes the following new genera of fungi: *Polyclypeolum*, *Microcyclella*, *Cyclotheca*, *Cryptopus*, and *Ellisiodothis;* also (Broteria Ser. Bot. **12**:13–33. 1914) a new genus (*Phaeoschiffnerula*) is added to the fungus flora of Brazil. The same author with H. SYDOW (*ibid.* 176–194) under the heading "Dothideazeen-Studien" in addition to critical notes on several species describes 8 additional new genera, namely *Trichodothis*, *Phragmodothis*, *Trabutiella*. *Pyrenobotrys*, *Stalagmites*, *Rehmiodothis*, *Phaeodothiopsis*, and *Parmulina*.—A. THELLUNG (Rep. Sp. Nov. **13**:301–303. 1914) characterizes 6 new varieties and forms of *Lepidium bonariense* L. from South America.—C. TORREND (Broteria Ser. Bot. **12**:53–71. 1914) lists the third century of his "Fungi selecti exsiccati"; several new species are described and one new genus, namely *Botryochora* of the Dothideaceae from Mozambique, is proposed.—A. E. TRAAEN (Nyt Mag. f. Naturv. **52**:19–121. *pl. 4.* 1914) under the title "Untersuchungen über Bodenpilze aus Norwegen" includes the descriptions of two new genera, namely *Geomyces* and *Humicola*.—E. ULE (Bot. Jahrb. **50**:Beibl. no. 114, pp. 1–18. 1914) under the title "Beiträge zur Kenntnis der brasilianischen Manihot-Arten" has published 15 new species.—I. URBAN (Rep. Sp. Nov. **13**:444–459. 1914) has described 24 new species of flowering plants from the West Indies.—W. WEINGART (Monats. für Kakteenkunde **24**:81–84, 123–127. 1914) has published a new species of *Phyllocactus* (*P. Ruestii*) from Honduras and a new *Cereus* (*C. acanthosphaera*) from Mexico.—H. F. WERNHAM (Bull. Kew pp. 63–69. 1914) enumerates the Rubiaceae collected by T. A. SPRAGUE in Venezuela and Colombia in 1898–99 and includes the descriptions of 11 new species. The same author (Jour. Bot. **52**:225–227; 313–316. *pl. 533.* 1914) has published 17 new species of Rubiaceae from Central and South America. One new genus (*Neosabicea*) is added from

Columbia.—E. DE WILDEMAN (Rep. Sp. Nov. **13**:369–384. 1914) has published 35 new species and varieties of flowering plants from Central Africa and characterizes two new genera, namely *Brieya* of the Anonaceae and *Giorgiella* of the Passifloraceae. The same author (Bull. Jard. Bot. Brux. **4**:1–241. 1914) in cooperation with specialists has issued "Additions à la flore du Congo." Several species new to science are included and the following new genera are proposed: *Volutellopsis* and *Gilletia* Torrend of the Mucedinaceae.—G. W. WILSON (Mycologia **6**:192–210. *pls. 135, 136*. 1914) in continuation of his studies on the Peronosporales describes several new species and propose as new genus (*Bremiella*) based on *Peronospora megasperma* A. Berlese.—L. WITTMACK (Bot. Jahrb. **50**:539–555. 1914. Supplement-Band) has published 6 new species of *Solanum* from South America.—N. WORONICHIN (Bull. für Ang. Bot. **7**:431–440. *pl. 120*. 1914) describes and illustrates a new fungus (*Plectodiscella piri*) found in the Kaukasus. The genus is said to represent a new family, namely the Plectodiscelleae.—C. H. WRIGHT (Bull. Kew p. 330. 1914) has published a new species of *Hippeastrum* (*H. Elwesii*) from Argentina. The same author (Curtis' Bot. Mag. *pl. 8553*. 1914) describes and illustrates a new species of *Zephyranthes* (*Z. cardinalis*) from specimens growing in the Kew Gardens but presumably of American origin.—J. M. GREENMAN.

Root nodules.—BOTTOMLEY[5] has investigated the root nodules of *Ceanothus americanus*, to which attention was called by BEAL in 1890. He finds that the nodules are modified lateral roots which increase in size each year by the formation of endogenous outgrowths similar in structure to the primary branch. Each nodule when fully grown shows an apical meristematic zone, an infection zone, a bacterial zone, and a basal zone almost free from bacteria. The bacteria when isolated and grown in pure cultures can fix free nitrogen, and evidently belong to the *Bacillus radicicola* group.

Miss SPRATT[6] has studied the well known root nodules or "coralline roots" of the cycads, and finds that all the genera produce them. They are developed primarily by infection with *Bacillus radicicola*, and at the base of each nodule a whorl of lenticels or a continuous zone of parenchyma is produced. The outer cell walls become pushed apart, and are infected by *Azotobacter*, and under certain conditions by *Anabaena* also. The alga is said to stimulate the phellogen to produce other lenticels, from which a zone of tissue is produced that includes the original outer cells in which the alga and bacteria occur. The algal zone is continuous, and consists of a large air space containing *Anabaena* and *Azotobacter*, which is kept intact by papillate cells traversing it from both inner

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[5] BOTTOMLEY, W. B., The root nodules of *Ceanothus americanus*. Ann. Botany **29**:605–610. *pl. 28*. 1915.

[6] SPRATT, ETHEL ROSE, The root nodules of the Cycadaceae. Ann. Botany **29**: 619–626. *pl. 29*. 1915.